

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE REGULATORY CONTACT RECORD

Date/Time: September 30, 2003

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Agency: CDPHE

Purpose of Contact: Advanced Size Reduction Facility (ASRF) Disposition

Discussion: In accordance with the 776/777 DOP, Appendix I, the preparation of the facility for demolition is conducted in consultation with the CDPHE and is based on a series of decisions primarily related to maintaining releases to the environment and doses to the workers as low as reasonably achievable (ALARA). This contact record and the attachment document the activities that were conducted to prepare the ASRF for demolition.

A series of meetings and discussions have been conducted with CDPHE on the feasibility of removing the ASRF prior to demolition and possible decontamination techniques. It was determined that the removal of the ASRF before demolition involved unacceptable risk to worker safety. Therefore, several decontamination efforts were conducted that are summarized in the attached ASRF Radiological Evaluation.

In addition to the radiological hazards, the non-radiological hazards have also been addressed in the ASRF. The following summarizes the non-radiological activities:

- Resource Conservation and Recovery Act (RCRA) units have been closed in accordance with the DOP. There were four RCRA units associated with the ASRF: container storage unit 776.1, waste treatment unit 776.3, and pencil tanks T-344 and T-345 (units 94.005 and 94.006). Closure included:
 - Pencil tanks T-344 and T-345 and associated ancillary piping and pumps in filter glovebox J-341 were closed by removal and packaged as TRM waste,
 - Gloveboxes J-176, J-177, J-270, J-340, J-357, and J-341, as well as the stainless steel floor of the ASRF were cleaned and verified closed using the debris rule standard. The gloveboxes were subsequently removed.
- Chemicals and hazardous substances have been removed.
- Beryllium regulated and controlled areas have been closed. As of September 16, 2003, the ASRF is no longer a beryllium controlled area.

- Polychlorinated biphenyls (PCB) hazards and equipment have been removed
- Asbestos will be abated. The internal portions of the ASRF are asbestos free; there are some exterior fittings with asbestos containing materials that will be removed, but will not be affected by the encapsulation activity.

Based on the survey results and the principles of ALARA, the risks (industrial and radiological) to the workers are greater than the benefit in source term reduction, which would be gained through additional decontamination. The state project representative agrees that decontamination inside the ASRF has progressed to the point of reasonably achievable removal and that the subsequent step of fixative application is now appropriate.

Suitability of the proposed path of ASRF demolition with external building shell demolition will be determined based on evaluation of the fixatives' efficiency in conjunction with other controls. An engineering evaluation is currently being conducted to determine if the facility can be demolished up to the ASRF and a controlled process employed to dismantle the ASRF with minimal stockpiling. Details on demolition controls will be contained in the work packages. Future decisions will be made using the consultative process with the regulators.

In summary, ALARA-based decontamination has been completed, the ASRF will be encapsulated and surveyed for removable contamination, and controls will be applied during demolition. This contact record will be included as an appendix to the characterization report for the ASRF.

Contact Record Prepared by: Dyan Foss

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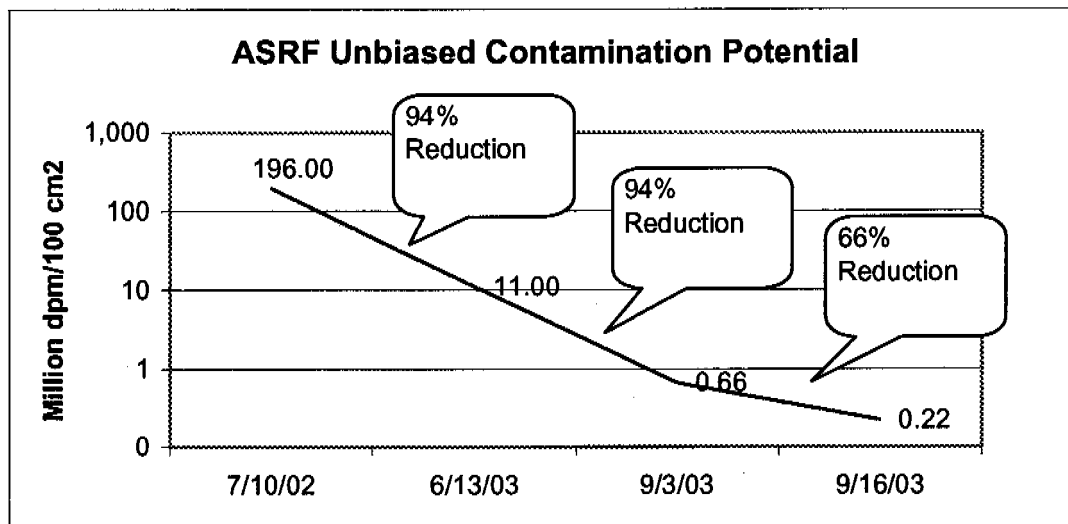
ASRF Radiological Evaluation

Purpose

The purpose of this evaluation is to review the decontamination efforts on the ASRF and determine an appropriate end point of this work. Based on this evaluation the ASRF will be sprayed with a fixative and left to be demolished as part of B776/777 demolition.

Summary

The ASRF had undergone three significant decontamination efforts over the past year in order to justify allowing this structure to be left as part of the B776/777 demolition. The chart below shows a summary of the average contamination levels left in the ASRF after each decontamination effort:



At present, the ASRF has an average total surface area contamination of 220,000 dpm/100 cm² (10 µCi/m²) with the removable contamination being approximately 20,000 dpm/100 cm².

Furthermore, the ASRF was characterized for 'nooks and crannies' contamination potential which included the areas behind the overhead railings and glovebox protrusions. This surface area made up 5% of the total ASRF surfaces. We expected that these areas had over 500 Million dpm/100 cm² prior to decon and after several decon attempts, these areas were reduced to having an average total contamination of 4 Million dpm/100 cm². The total source term for the ASRF, including the contamination behind the 'nooks and crannies', is determined to be 16,000 µCi.

Discussion

The following discussion is complex because it includes two main elements. One element being the accessible flat surface areas (walls, floor, ceiling), and the other element being 'nooks and crannies' areas (behind the overhead railings, glovebox protrusions, etc.). The 'nooks and crannies' portion makes up approximately 5% of the surface area within the ASRF; however, it has a higher potential for contamination, which must be considered when determining total source term.

As found condition - Initial Characterization of ASRF – July 10, 2002

Prior to the stripout and cleanout of the ASRF, an initial characterization was performed on both sides of the RDA (7/10/02) with levels averaging 196 Million dpm/100 cm². In addition, a maximum reading of 740 Million dpm/100 cm² was detected.

First Decon Effort followed by First complete survey – June 13, 2003

After all the equipment was removed, the ASRF was deconned with standard methods of damp wiping. The first complete survey of the ASRF was performed on 6/13/03. This initial characterization was used to get a general idea of the condition of the ASRF. The characterization resulted in average levels of 11 Million dpm/100 cm² with a maximum reading of 750 Million dpm/100 cm². The maximum reading was on a support bracket for the Mezzanine. (Note: This characterization did not include 'nooks and crannies' surfaces.)

Second Decon Effort followed by a Second complete survey – September 3, 2003

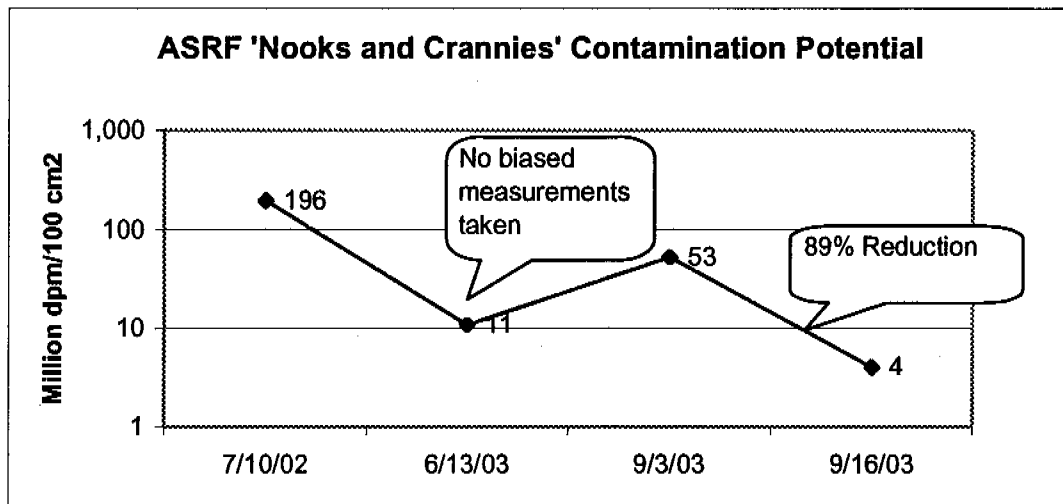
Chemical decon was introduced into the ASRF with a focus on the highest contaminated areas. There were 11 areas that had an initial average of 111 Million dpm/100 cm² direct with 500,000 dpm/100 cm² removable. After decon on 7/11/03, these same areas averaged 1 Million dpm/100 cm² direct and 100,000 dpm/100 cm² removable. This demonstrated a high success of the chemical decon process and resulted in an effort to use this method across the entire ASRF structure. Furthermore, the ASRF received a complete pressure wash after chemical decon to perform additional decon and rinse the residues from the chemical decon process.

On 9/3/03 another complete survey was performed on the ASRF that resulted in an average of almost 14 Million dpm/100 cm², with a maximum reading of 159 Million dpm/100 cm². This survey was performed over the entire ASRF; however, the RCTs were instructed to bias their surveys by searching for the highest contamination in each survey area, to ensure a level of comfort regarding the potential for 'nooks and crannies' contamination. Several areas were surveyed behind the railings in the overhead, and other items that had a potential for 'nooks and crannies' contamination. When the 'nooks and crannies' survey data was extracted from the 9/3/03 survey, the walls, floor and ceiling surfaces were averaged at 660,000 dpm/100 cm², with the 'nooks and crannies' averaging 53 Million dpm/100 cm².

Third Decon effort followed by Final Survey – September 16, 2003

The 9/3/03 characterization identified several areas for follow-up, which included requiring a complete decon of the overhead railings and several other areas within the ASRF. Furthermore, the decon effort required a visual inspection behind the rails to ensure no soot or dark material was present. Besides using the standard chemical decon, another decon solution was introduced into the ASRF, called Radiac Wash. Also, the decon effort included having an RCT inside the ASRF during the decon process for survey purposes. Surveys were taken prior and post decon with a significant reduction in the items being deconned. The areas deconned averaged 53 Million dpm/100 cm² direct and 2 Million dpm/100 cm² removable before decon and 4 Million dpm/100 cm² direct and 130,000 dpm/100 cm² removable after decon.

The chart below demonstrates the decon effort for the 'nooks and crannies' surfaces within the ASRF.



A survey plan was developed for the final survey of the ASRF that was based on the same philosophy as the Radiological Pre-Demolition Survey Plan Building 776/777. This final survey indicated that the average surface area contamination was 220,000 dpm/100 cm² with an average removable contamination of 20,000 dpm/100 cm².

Determining Source Term

The average surface area activity and source term can be calculated below:

ASRF Interior Surface Area ≈ 9100 sq ft – 500 sq ft ('nooks and crannies' areas, which includes the backside of railings and other surfaces within ASRF) ≈ 8600 sq ft

Average contamination level is 220,000 dpm/100 cm² (10 μ Ci/m²)
Total Activity is 18E9 dpm (8E3 μ Ci)

ASRF Potential 'nooks and crannies' Surface Area (includes the back side of the railings) ≈ 500 sq ft

Average contamination level is 4,000,000 dpm/100 cm² (180 μ Ci/m²)
Total Activity is 19E9 dpm (8E3 μ Ci)

Total ASRF Surface Area ≈ 9100 sq ft

Total average surface area contamination level is 4.4E5 dpm/100 cm² (20 μ Ci/m²)
Total Activity is 37E9 dpm (16E3 μ Ci)

Conclusion

Decontamination efforts to-date have resulted in a reduction from 196 Million dpm/100 cm² to 220,000 dpm/100 cm². This is a reduction factor of 99.9%. There was considerable effort after September 3rd to remove contamination behind the railings and other 'nooks and crannies' areas within the ASRF. This effort alone resulted in removing over 100,000 μ Ci of WGPu, leaving a total source term of 16,000 μ Ci in the ASRF.

Air Quality Management had determined that a maximum 1-week inhalation dose based on the source term of 16,000 μ Ci would result in a dose of 0.22 mrem at 30 meters and 0.00045 mrem at the fenceline (see attached).

Attachment

ASRF Demolition Modeling Analysis